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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,372	02/26/2004	ERH-KUN LAI	12680-US-PA	2371
31561	7590	12/01/2004	EXAMINER	
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE			WARREN, MATTHEW E	
7 FLOOR-1, NO. 100			ART UNIT	
ROOSEVELT ROAD, SECTION 2			PAPER NUMBER	
TAIPEI, 100			2815	
TAIWAN			DATE MAILED: 12/01/2004	

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/708,372

Applicant(s)

LAI

Examiner

Matthew E Warren

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 12-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

This Office Action is in response to the Election and Amendment filed on November 1, 2004.

### ***Election/Restrictions***

Applicant's election without traverse of Group 1, claims 12-19 in the reply filed on November 1, 2004 is acknowledged.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Poon et al. (US 5,436,488).

In re claim 12, Poon et al. shows (fig. 10) a shallow trench isolation structure (40) comprising: a substrate (12) having a trench (24) therein; an insulating layer (34), disposed in the trench, wherein the insulating layer has an upper surface higher than an upper surface (23) of the substrate; and a liner layer (44) formed over the substrate covering the insulating layer.

In re claim 13, Poon shows (fig. 10) that the liner extends to an upper surface of the substrate to cover it.

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In re claim 14, Poon inherently discloses that the liner has a low etching selectivity relative to the insulating layer because the liner is made of SiN (col. 3, line 58 – col. 4, line 5) and the insulating layer is made of oxide (col. 3, lines 1-14).

In re claim 15, Poon discloses (col. 3, lines 58-63) that the liner has a thickness less than 20 nm (equal to 200 Angstroms), which fits the range listed in the claim.

In re claims 16 and 17, Poon discloses that the liner is an insulating layer of silicon nitride (col. 3, line 58 – col. 4, line 5).

In re claim 18, Poon shows (fig. 10) that a pad oxide (42) is formed between the liner and the substrate.

Claims 12-14 and 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Godejahn, Jr. (US 4,587,711).

In re claim 12, Godejahn, Jr. shows (fig. 29) a shallow trench isolation structure comprising: a substrate (32) having a trench therein; an insulating layer (50), disposed in the trench, wherein the insulating layer has an upper surface higher than an upper surface of the substrate; and a liner layer (56) formed over the substrate covering the insulating layer.

In re claim 13, Godejahn, Jr. shows (fig. 29) that the liner extends to an upper surface of the substrate to cover it.

In re claim 14, Godejahn, Jr. inherently discloses (col. 12, lines 49-57) that the liner has a low etching selectivity relative to the insulating layer because the liner is made of SiN and the insulating layer is made of oxide.

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In re claims 16 and 17, Godejahn, Jr. discloses (col. 12, lines 49-57) that the liner is an insulating layer of silicon nitride.

In re claim 18, Godejahn, Jr. shows (fig. 29) that a pad oxide (54) is formed between the liner and the substrate.

In re claim 19, Godejahn, Jr. shows (fig. 29) that another insulating layer (58) covers the liner layer.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lin et al. (US 6,211,022 B1) also shows a shallow trench structure having a liner formed over it.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E Warren whose telephone number is (571) 272-1737. The examiner can normally be reached on Mon-Thur and alternating Fri 9:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MEW

*MEW*  
November 24, 2004

*Tom Thomas*  
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